# *Course Syllabus*

PHYS 2126; PHYSICS LABORATORY II summer 2008

**Professor Contact Information**


Instructor: Paul MacAlevey
Office: FO 2.708B extension 4634. (I'll be moving to ECSN 2.222 sometime after June 9.)

E-mail: paulmac@utdallas.edu I will send e-mail to UTD e-mail addresses only.

Mailbox: In office FO 2.724


All sections of this class meet in Founders North FN 2.212. The times at which sections meet are as follows:

| Section | Day | Time |
|---|---|---|
| **1U1** | Tuesday | 9:30 – 12:15 |
| **1U2** | Thursday | 5:30 – 8:15 |

**Course Pre-requisites, Co-requisites, and/or Other Restrictions**
Any student enrolling in this lab class should either have done or be doing PHYS 2326 (Electromagnetism & Waves) or equivalent.

---

**Office hours**: Several TAs will be assigned to this course. Their office hours have yet to be arranged but will be posted on the WebCT site for the course. Otherwise, office hours are by appointment at my office.

**Course Description**

The course includes experiments designed to explore several areas in Electricity and Magnetism. The experiments in PHYS 2126 give you the opportunity to examine several phenomena in detail. As always in Physics, there is interplay between the theory that you see in a class and experimental work. One is not more important than the other but one informs the other: theoretical predictions are a natural focus of experiment and experimental results help to develop theory. That is why you need to study both.

Some labs involve the building of electrical circuits but this lab course is not an introduction to electric circuits. An understanding of electric current is important to an understanding of many electromagnetic phenomena and about half of the experiments develop knowledge about electric current. The others concern electrostatics, magnetic fields caused by currents and induction, etc.

---

**Student Learning Objectives/Outcomes**

*PHYS 2126 Physics Laboratory II* is a course that includes experiments designed to explore several areas in Electricity and Magnetism.

Experiments concern electrostatics, electric current, magnetic fields caused by currents and induction. We use a manual that I have written and that is copied by the copy center for students. The aims of the course are to perform experiments in which:

- Students will explain observations of simple electrostatic phenomena in writing. Among these is that conductors must become polarized in the presence of charge.

- Students will make graphs (with Excel) and will fit suitable trendlines. Deductions will be made given the statistics obtained from fitting these trendlines. These graphs include graphs of current versus voltage (in resistive circuits) and graphs of voltage versus time in RC circuits)

- Students will compute time constants given changing voltages in circuits that involve resistors and capacitors.

---

**Required Textbooks and Materials**

**You need a lab manual at every lab meeting of your section**. You can get a one at the campus bookstore. (I have put material for the first week from the manual on WebCT sites for sections of this course. If you have difficulty getting a printed copy, then print material for the first week from the WebCT site.)

**Suggested Course Materials**

You should have a calculator, pencil and pen at all meetings of your section. (The calculator need only be a 'scientific' one.)

---

**Assignments & Academic Calendar**

All students are expected to read the section headed 'introduction' before the lab meeting. This will help you to complete the Pre-Lab that is due at the beginning of every lab meeting (except the first one). The lab report consists of answers written to questions posed in the lab manual. Answers are to be written in spaces provided in the 'Report' section of the manual. The sheets are to be taken out of the manual, stapled and given to your TA before/at the end of each lab meeting. A detailed schedule appears in the lab manual.

This course is associated with PHYS 2326 (Electromagnetism and Waves). Different sections of these courses emphasize different topics and are conducted

according to different schedules. This means that you should expect to see some topics for the first time in this lab course. Lab time is limited so I ask all students to read the introduction to each experiment and do the Pre-Lab in the week before the experiment. Ask questions during office hours before your lab meeting.

# Semester Calendar

| **Dates** | **Lab Exercise** |
|---|---|
| May 27 & 29 | Course information<br>Introduction to Multimeters & Power Supplies.<br>Drawing Graphs |
| June 3 & 5 | Electric Fields and Electric Potentials |
| June 10 & 12 | Ohm's Law Experiment |
| June 17 & 19 | EKG |
| June 24 & 26 | Voltage Decay Across a Capacitor |
| July 1 & 3 | Introduction to Oscilloscopes |
| July 8 & 10 | RC circuits |
| July 15 & 17 | Magnetic Force Between Parallel Conductors |
| July 22 & 24 | Motor Experiment |

---

**Grading Policy**

There are no exams in this course. You course grade is determined by grades on your lab reports etc. **It is important that lab reports are your own work**. Every individual student will turn in a lab report at every meeting of their section. (You will also turn in a pre-lab at all meetings except the first.) Lab reports must be turned in on the same day that any experiment is done in order to attract credit. The average of these grades will be used to compute your numerical grade for this course. These numbers are turned into letter grades as follows; If $x$ is a numerical grade then,

| | | | |
|---|---|---|---|
| $x \geq 95$ | A+ | $70 > x \geq 65$ | C+ |
| $95 > x \geq 90$ | A | $65 > x \geq 60$ | C |
| $90 > x \geq 85$ | A- | $60 > x \geq 55$ | C- |
| $85 > x \geq 80$ | B+ | $55 > x \geq 50$ | D+ |
| $80 > x \geq 75$ | B | $50 > x \geq 45$ | D |
| $75 > x \geq 70$ | B- | $45 > x \geq 40$ | D- |
| | | $40 > x$ | F |

---

**Course & Instructor Policies**

**The course policies for the current semester are in the current manual**. Please refer to that source for more information but here are a couple of the policies.

0. These course policies have been designed by the instructor for the course: Dr. P. MacAlevey. Please contact me if a question arises about these policies. The syllabus and contact information for all TAs will be posted on WebCT.

1. There are no exams in this course. Your grade is determined by an average of grades on your Pre-Labs and lab Reports (and the assignment on Graphs). **It is important that these are your own work**. Conversation between group members may occur. However, **no student can copy or paraphrase the work from any other source and turn it in for a grade**. (See policy #10. for more on scholastic dishonesty.) All group members must contribute to the gathering of data etc.

2. All students are required to turn both a Pre-Lab and a Report for every lab experiment (except the first). The **Pre-Lab** (written in ink) is **due at the beginning of your lab meeting**. The **Report** (with answers written in ink) is **due at the end of the lab meeting** in which the experiment is done. Late Pre-labs or Reports attract no credit.

   Questions will be posed in bold type in the Introduction to an experiment. Think about these questions as they occur: they will appear again either in the Pre-Lab or the Report. Take the Pre-Lab sheets and the Report sheets out of your manual and write your answers in the spaces provided. Pre-Labs will be graded on a six-point scale. Reports will be given credit as indicated in brackets after each question.

**3.** You might want to begin taking data/writing observations things provisionally in pencil. That is fine once your report has a more permanent record. **Reports must include data written in pen that you collect. Always write your name in pen on graphs/plots of field lines etc. Please staple your Pre-Labs and Reports for your TA.**

4. Each description of an experiment in this manual consists of an Introduction and Instructions. **Read the Introduction to the experiment and write any required Pre-Lab <u>before</u> the meeting of your section**. Ask questions during TA's office hours if needed.

   This manual is a brief description of some experiments. It is not intended to be a comprehensive Physics textbook. Some sections of an introductory Physics

books might be useful. (These books include “University Physics” by Young and Freedman, “Physics for Scientists and Engineers” by Serway & Jewett and “Fundamentals of Physics” by Halliday, Resnick & Walker etc.)

The co-requisite classes, PHYS 2326 (Electromagnetism & Waves) may be helpful in this lab. **However no section of these classes follows the same schedule as this separate course. Thus, you might see some topics for the first time in this lab.**

5. You will need to use a **scientific calculator, a pen, a ruler** and a **sharp pencil at all lab meetings.**

6. **Leave the equipment in good working order** for the next lab class. All apparatus must be arranged on the lab bench as it was before your section. **Expect your TA to look at your workstation just before your group leaves**. Inform your TA if something is missing.

   In a lab class there are cases in which equipment doesn’t perform as expected. We would like to minimize this and expect your help. One way to help is to tell your TA about any equipment that doesn’t seem to work as you expect. (The difficulty might be these expectations!) Other simple things that help include turning off meters when not using them and doing the experiment as described rather than aimlessly ‘playing’ with apparatus.

7. Experiments are to be done in **groups of three** (or four at the most). Your TA may ask anyone to work with a different group (in order that groups will be roughly the same size or for any other reason that the TA thinks appropriate). It will be easier to understand the experiment if you work in a small group…

8. **Attend the lab section for which you registered**. You may attend another section of the lab class only if the following procedure is followed;

   a. E-mail both the TA in charge of the section that you would like to attend and your own TA saying why you need to attend the other section

   b. If there is enough apparatus etc. to accommodate you at the other section, an e-mail will be sent to you saying that your suggested change is possible. You must wait for this reply.

9. You can make-up a lab if you miss the meeting of your section. Deciding not to turn in a report will give you a zero and will reduce your grade. **No result from a lab report will be dropped**. If yours is not the last section of the week, you may be able to go to another section. If so, follow the procedure of policy #8.

If you are unable to attend another section in the week of an absence, then attend the make-up session at 10:00 on Friday. **A student can make up one experiment at any of the next three make-up sessions following their absence**. **A completed Pre-lab must be brought to the make-up session**. These make-up sessions will be held on dates posted on WebCT. (If nobody shows up twenty minutes after the beginning of any make-up session or office hour then the TA in charge is free to leave. Please check WebCT for a schedule of make-up labs.)

Irrespective of whether you make-up a lab in another section or in a make-up session, you should check that the TA for the section in which you are registered records the score for the lab.

**In general, labs that are missed should be made up as soon as possible**. However, circumstances may prevent you from making up a lab quickly. (These include an illness certified by a medical doctor, jury duty …) In such cases, send me an e-mail **as soon as possible after the absence**. I will ask you to bring the completed Pre-lab for the missed experiment(s) and **formal documentation** to my office. If I think that the reason for the absence is adequate, we can organize a time for you to do the experiment. I urge students to **make-up any missed lab early in the semester** rather than using this last option. You should be particularly careful to avoid absences near the end of the lab schedule (& make-up sessions). **If I have not received formal documentation about an absence before the last scheduled make-up session then that absence will not be excused.**

10. Of great importance to you as a student is that others perceive your degree as having value. That value is diminished if others suspect that a grade can be obtained through dishonest means. As your instructor, academic dishonesty gives me a false picture of the capabilities of the individual that is being dishonest. In a wider context, it gives me a false picture of what can be reasonably expected of my students.

In order to further the objective of eliminating scholastic dishonesty, the University has a policy on scholastic dishonesty. This policy is clearly articulated in Subchapter F section 49.36 of the policy on student discipline & conduct adopted by the University and used in this course. The full chapter 49 is at http://www.utdallas.edu/student/slife/chapter49.html. **Students enrolling in the course are bound by this policy**. **Any suspected cases of scholastic dishonesty will be passed along to the Dean of Students**. **All Pre-Labs and lab Reports submitted for grading must be written by the student named at the top of the report.**

11. I used this scheme for generating (a first approximation to) grades in previous semesters. Any modifications to it will only be made to help grades! If $x$ is a score then,

| | |
|---|---|
| $x \geq 95$ | $70 > x \geq 65$ |
| A+ | C+ |
| $95 > x \geq 90$ | $65 > x \geq 60$ |
| A | C |
| $90 > x \geq 85$ | $60 > x \geq 55$ |
| A- | C- |

| | |
|---|---|
| $85 > x \geq 80$ | $55 > x \geq 50$ |
| B+ | D+ |
| $80 > x \geq 75$ | $50 > x \geq 45$ |
| B | D |
| $75 > x \geq 70$ | $45 > x \geq 40$ |
| B- | D- |
| | $40 > x$ |
| | F |

No grade is official unless given by Dr. MacAlevey.

12. In the event of inclement weather etc, check the UT-D Web page http://www.utdallas.edu/ for notice of any class cancellation etc. Classes will meet if no contrary announcement is posted on this Web page.

---

**Student Conduct & Discipline**

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

**Academic Integrity**

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

## Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

## Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

## Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the deal will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

## Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the

required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

## Disability Services

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:
The University of Texas at Dallas, SU 22
PO Box 830688
Richardson, Texas 75083-0688
(972) 883-2098 (voice or TTY)

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

## Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

***These descriptions and timelines are subject to change at the discretion of the Professor.***